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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,458	05/23/2001	Masahiko Tanaka	001425-104	7476

21839 7590 11/06/2002

BURNS DOANE SWECKER & MATHIS L L P
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 11/06/2002

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/862,458

Applicant(s)

TANAKA ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,8-11,14-17 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 2,3,6,7,12,13,18 and 19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 5-8 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims an apparatus where said plurality of holes are formed to satisfy the condition $uL/D > 1$, where u is the gas flow rate inside the holes, L is the effective length of the holes and D is the gas interdiffusion coefficient. However, the definition and calculation of gas interdiffusion coefficient is not clearly disclosed in either the specification or the claims. While the specification does define the interdiffusion gas coefficient as "the gas interdiffusion coefficient of the two types of gas at both ends of the holes", no explanation or example is given as to what Applicant means by "the two types of gas".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4-5, 8-9, 11, 14-15, 17 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (figures 1a, 1b; paragraphs 3-10 of specification) in view of U.S. Patent Np. 6,086,677 to Umotoy et al.
5. The admitted prior art discloses a thin film deposition apparatus substantially as claimed and comprising: a vacuum chamber (paragraph 7) and a dividing plate (figure 1a, 24), the vacuum reaction chamber is divided by the dividing plate into a plasma discharge space and a film deposition process

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space (paragraph 7), the dividing plate having internal spaces (figure 1a, 4-7) and a plurality of holes (figure 1, 8) therein, the internal spaces are separated from said plasma discharge space and the internal spaces are connected with the film deposition process space, the plurality of holes connect the plasma discharge space with the film deposition process space, and a plasma is used to generate radicals in the plasma discharge space, which radicals are introduced into the said film deposition process space through the plurality of holes in the dividing plate, and a precursor gas is directly introduced into the film deposition process space from the internal spaces, whereby the radicals and the precursor gas introduced into the film deposition process space react together to deposit a film on a substrate disposed in the film deposition process space, the dividing plate is made of a plurality of laminated plates (1-3) connected together by fixing means (figure 1a and 1b,9; paragraph 8) at their outer perimeter

6. However, the prior art fails to teach the plurality of laminated plates connected together by securely bonding them over substantially an entire area of their interfacial surfaces.

7. Umotoy et al. teach fusing together plurality of laminated plates at their contacting surfaces for the purpose of avoiding the use of o-rings while maintaining a separation of gases as they transition from an upper plate to a lower plate (column 3, rows 33-44 and column 5, rows 15).

8. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plurality of laminated plates fused together at their contacting surfaces in order to avoid the use of o-rings while maintaining a separation of gases at they transition from an upper plate to a lower plate as taught by Umotoy et. al.

9. With respect to claims 5 and 8, the admitted prior art and Umotoy et al. disclose the invention substantially as claimed and as described above.

10. However, the prior art fails to teach the plurality of holes formed to satisfy the condition $uL/D > 1$, where u is the gas flow rate inside the holes, L is the effective length of the holes, and D is the interdiffusion coefficient.

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11. With respect to gas hole configurations, Umotoy et al. teach that the choice of hole size for each gas is purely a process condition and as such, hole size will depend on gas flow rate, gas pressure, gas type, chamber pressure and the like (column 5, rows 57-63).

12. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to find an optimum gas hole configuration based on the conditions of each individual process as taught by Umotoy et al.

13. Further, the courts have ruled where the general conditions of a claim are disclosed by the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

14. Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Umotoy et al. as applied to claims 1, 4-5, 8-9, 11, 14-15, 17 and 20-23 above, and further in view of U.S. Patent No. 5,433,786 to Hu et al.

15. The admitted prior art and Umotoy et al. disclose the invention substantially as claimed and as described above.

16. However, the prior art fails to teach the plurality of plates bonded together by a plurality of rivets.

17. Hu et al. teach the use of rivets and other suitable fastening means for the purpose of assembling an electrode (column 3, rows 53-55).

18. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided rivets or other suitable fastening means in the prior in order to assemble the dividing plate as taught by Hu et al.

Allowable Subject Matter

19. Claims 2-3, 6-7, 12-13 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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20. The prior art fails to teach or fairly suggest a plurality of metal fixings (either rivets or threaded parts) to securely bond the laminated plates over the entire area of their interfacial surfaces, and **the plurality of holes provided in the dividing plate are provided through the plurality of metal fixings.**

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
November 3, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700